

Application for Consent to conduct  
Marine Scientific Research

Date: \_30.11. 2016\_\_\_\_\_

1. General Information

1.1 Cruise name and/or number: 2017106
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1.2 Sponsoring Institution(s):	
Name:	Department of Earth Science, University of Bergen
Address:	Allegt 41, N-5007 Bergen, Norway
Name of Director:	Gunn Mangerud

1.3 Scientist in charge of the Project:	
Name:	Berit Oline Hjelstuen
Country:	Norway
Affiliation:	University of Bergen, Department of Earth Science
Address:	Allegt 41, N-5007 Bergen
Telephone:	+47 55 58 35 07
Fax:	+ 47 55 58 36 60
Email:	berit.hjelstuen@uib.no
Website (for CV and photo):	www.uib.no/personer/Berit.Hjelstuen

1.4 Entity(ies)/Participant(s) from coastal State involved in the planning of the project:	
Name:	Chris Clark
Affiliation:	Department of Geography
Address:	University of Sheffield, Sheffield, S10 2TN
Telephone:	+ 44 (0) 114 222 7941
Fax:	
Email:	<a href="mailto:c.clark@sheffield.ac.uk">c.clark@sheffield.ac.uk</a>
Website (for CV and photo):	<a href="https://www.sheffield.ac.uk/geography/staff/clark_chris/index">https://www.sheffield.ac.uk/geography/staff/clark_chris/index</a>
Name:	Colm O'Cofaigh
Affiliation:	Department of Geography
Address:	Durham University, Lower Mountjoy South Road, Durham DH1 3LE, UK
Telephone:	+44 (0) 191 33 41890
Fax:	+44 (0) 191 33 41801
Email:	<a href="mailto:colm.ocofaigh@durham.ac.uk">colm.ocofaigh@durham.ac.uk</a>
Website (for CV and photo):	<a href="https://www.dur.ac.uk/geography/staff/geogstaffhidden/?id=1008">https://www.dur.ac.uk/geography/staff/geogstaffhidden/?id=1008</a>

2. Description of Project

2.1 Nature and objectives of the project:
The main purpose of the research project is to collect acoustic data and geological data in order to reconstruct the last deglaciation in the northern North Sea

2.2 If designated as part of a larger scale project, then provide the name of the project and the Organisation responsible for coordinating the project:
GLANAM ( <a href="http://www.glanam.org">www.glanam.org</a> ), led by the Department of Earth Science, University of Bergen

2.3 Relevant previous or future research projects:
RAPID (previous project)

2.4 Previous publications relating to the project:

Sejrup, H.P., Clark, C.D., Hjelstuen, B.O., 2016. Rapid ice sheet retreat triggered by ice stream buttressing: Evidence from the North Sea. *Geology* 44(5), 355-358.

Sejrup, H.P., Hjelstuen, B.O., Nygård, A., Hafliðason, H., Mardal, I., 2015. Late Devensian ice marginal features in the central North Sea – processes and chronology. *Boreas* 44, 1-13.

Bigg, G.R., Clark, C.D., Greenwood, S.L., Hafliðason, H., Hughes, A.L.C., Levine, R.C., Nygård, A., Sejrup, H.P., 2012. Sensitivity of the North Atlantic circulation to break-up of marine sectors of the NW European ice sheets during the last Glacial: A synthesis of modelling and palaeoceanography. *Global and Planetary Change*, 98-99, 153-165.

### 3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in Latitude and longitude in decimal degrees, including coordinates of cruise/track/way points/sampling stations). Please provide coordinates in a separate excel spreadsheet.

The cruise study area is the Northern North Sea within box bounded by 55,35° N – 61,85° N and 0,50° W and 2,72° E. See also Figure 1 and attached Excel sheet.

3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical Areas of the intended work and, as far as practicable, the location and depth of sampling Stations, the tracks of survey lines, and the locations of installations and equipment.

See Figure 1, and attached excel sheet for information on survey lines and coring sites

### 4. Methods and means to be used

4.1 Particulars of vessel:	
Name:	“G.O.Sars”
Type/Class:	Research vessel
Nationality (Flag State):	Norwegian
Identification Number (IMO/Lloyds No.):	9260316
Owner:	Institute of Marine Research
Operator:	Institute of Marine Research
Overall length (meters):	77,5 metres
Maximum draught:	7,30 metres
Displacement/Gross Tonnage:	4067
Propulsion:	DC-Electric
Cruising & maximum speed:	10-11 kt, 17 kt
Call sign:	LMEL
INMARSAT number and method and capability of communication (including emergency frequencies):	Telephone: +47 55906440 Telefax: +47 55906441 E-mail: GOSars@IMR.no
Name of Master:	John Hugo Johansen/Preben Vindenes
Number of Crew:	15
Number of Scientists on board:	Max 12

4.2 Particulars of Aircraft: NA	
Name:	
Make/Model:	
Nationality (flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall Length (meters):	
Propulsion:	
Cruising & Maximum speed:	
Registration No.:	
Call Sign:	

Method and capability of communication (including emergency frequencies):	
Name of Pilot:	
Number of crew:	
Number of scientists on board:	
Details of sensor packages:	
Other relevant information:	

4.3 Particulars of Autonomous Underwater Vehicle (AUV): NA	
Name:	
Manufacturer and make/model:	
Nationality (Flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall length (meters):	
Displacement/Gross tonnage:	
Cruising & Maximum speed:	
Range/Endurance:	
Method and capability of communication (including emergency frequencies):	
Details of sensor packages:	
Other relevant information:	

4.4 other craft in the project, including its use:
NA

4.5 Particulars of methods and full description of scientific instruments to be used (for fishing gear specify type and dimension)		
Types of samples and Measurements:	Methods to be used:	Instruments to be used:
Sediment sampling	Various types of sediment coring systems	Calypso corer (max 21 m in length), Gravity corer (max 5 m in length), Box corer (max 60 cm) and Multicorer (max 60 cm in length)
Water characteristics	Underwater unit with sensor for conductivity, temperature, pressure and oxygen	911plus CTD system
Seismic profiling (see also 4.6)	High resolution seismic profiling system (keel mounted)	TOPAS PS18
Bathymetric profiling	Multibeam echosounder (keel mounted)	MBE302, MBE1002

4.6 Indicate nature and quantity of substances to be released into the marine environment: We may use small-power air guns (60 or 90 cubic inch) air guns along some of the planned TOPAS seismic profiles. During such surveying only one air gun will be in the water at any time.
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4.7 Indicate whether drilling will be carried out. If yes, please specify: No
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4.8 Indicate whether explosives will be used. If yes, please specify type and trade name, Chemical content, depth of trade class and stowage, size, depth of detonation, frequency of Detonation, and position in latitude and longitude: No
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5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and Anticipated timeframe for recover, as far as possible exact locations and depth, and Measurements):

No

6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:

Between 22. April 2016 and 2. May 2016

6.2 Indicate if multiple entries are expected:

Yes, we may have multiple entries

7. Port Calls

7.1 Dates and Names of intended ports of call:

No port calls planned

7.2 Any special logistical requirements at ports of call:

NA

7.3 Name/Address/Telephone of shipping agent (if available):

NA

8. Participation of the representative of the coastal State

8.1 Modalities of the participation of the representative of the coastal State in the research Project:

Partners in GLANAM-project

8.2 Proposed dates and ports for embarkation/disembarkation:

Between 22. April 2016 and 2. May 2016, Ports: Bergen, Norway

9. Access to Data, Samples and Research Results

9.1 Expected dates of submission to coastal State of preliminary report, which should include The expected dates of submission of the data and research results:

Preliminary report expected at the end of cruise – 2. May 2017

9.2 Anticipated dates of submission to the coastal State of the final report:

Final report expected 3 month after the end of cruise

9.3 Proposed means for access by coastal State to data (including format) and samples:

This will be handled through the GLANAM and BRITICE-CHRONO projects (<http://www.britice-chrono.group.shef.ac.uk/>)

9.4 Proposed means to provide coastal State with assessment of data, samples and Research results:

This will be handled through the GLANAM and BRITICE-CHRONO projects

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples And research results:

This will be carried out through the GLANAM and BRITICE-CHRONO projects

9.6 Proposed means of making results internationally available:

This will be done by participation in international conferences/workshops and by publishing in international journals

10. Other permits Submitted

10.1 Indicate other types of coastal state permits anticipated for this research (received or Pending):

NA

11. List of Supporting Documentation

11.1 List of attachments, such as additional forms required by the coastal State, etc.:

1. Excel sheet with coordinates of survey lines and coring sites
2. Figure 1- Overview map showing planned seismic profiles and coring sites (attached to last page of this document)

Signature:



Contact information of the focal point:

Name: Berit Oline Hjelstuen

Country: Norway

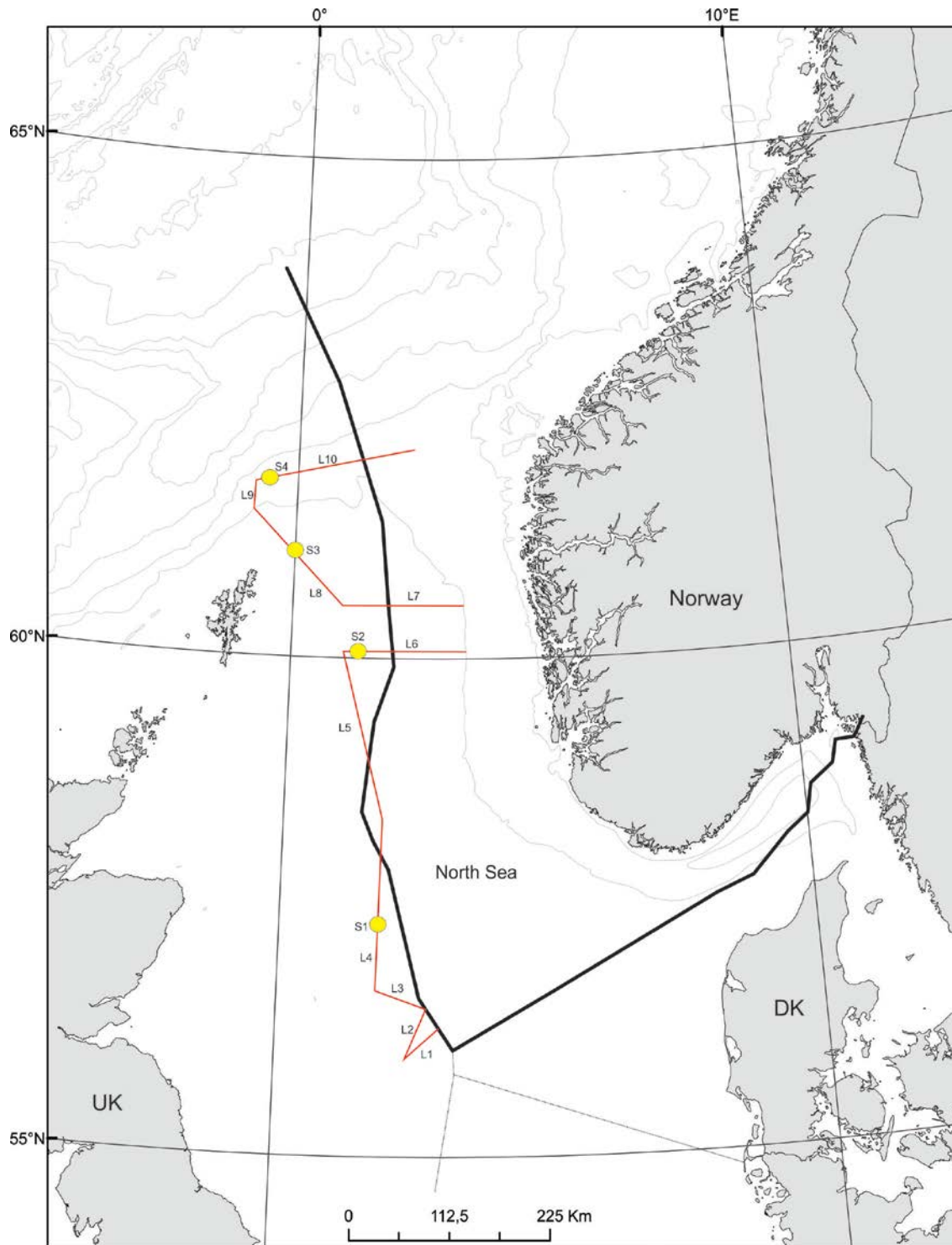
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**Figure 1.** Overview map showing planned seismic profiles (red lines annotated L1-L10) and coring sites (yellow dots annotated S1-S4). See attached excel file for more detailed information on location of profiles and coring stations.